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Mineral Industry Surveys

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MAGNESIUM IN THE THIRD QUARTER 2012

U.S. magnesium exports from January through September of 2012 were 58% more than exports in the same period of 2011. Canada (35%), Mexico (25%), and Singapore (20%) were the principal destinations. Magnesium imports for consumption in the first three quarters of 2012 were 7% more than those in the same period of 2011. Israel (85%) was the principal source of imported magnesium metal. China (32%) and Israel (26%) were the main sources of alloy imports. In the first three quarters of 2012, scrap represented 43% of the total imports, one-half of which came from Canada.

Quoted magnesium prices for the third quarter of 2012 are shown in table 2. U.S. prices decreased slightly while those in China and Europe increased slightly. Chinese prices increased mainly because of a shortage of coke gas in Shanxi and Shaanxi Provinces, the leading magnesium-producing areas in China. Several plants were closed because of the coke gas shortage. Heavy rain and hot temperatures also contributed to reductions in magnesium production in China (Leung and Yee, 2012). Through August, magnesium production in China of 430,000 metric tons (t) was about 15% less than that in the same period of 2011 (Platts Metals Week, 2012).

Negotiations among producers and consumers for 2013 magnesium contracts began in October. Press reports indicated that contract prices for pure magnesium were from $1.95 to $2.05 per pound, slightly lower than the 2012 contract prices (Waite, 2012).

The U.S. Department of Commerce, International Trade Administration (ITA), completed a second expedited 5-year sunset review of antidumping duties assessed on granular magnesium imported into the United States from China. As a result, the ITA determined that revocation of the duties would lead to a continuation or recurrence of dumping, and the antidumping duty would remain at 305.56% ad valorem, where it has been since 2001 (U.S. Department of Commerce, International Trade Administration, 2012).

Primary magnesium production at POSCO's 10,000-metric-ton-per-year Okgye magnesium plant in Gangneung, Gangwon Province, Republic of Korea, began in October. Plant construction was completed in July, and, after trial production, the plant shipped its first magnesium ingot at the beginning of October. POSCO plans to supply magnesium produced at the new plant to the company's magnesium plate operation in Suncheon, Jeonnam Province, and South Korean magnesium diecasting companies (POSCO, 2012).

General Motors Corp. (GM) developed a new thermal-forming process and corrosion-resistance treatment for magnesium alloys which would enable them to be used as an alternative to steel and aluminum for vehicle body panels. In GM's patented process, the alloy is heated to 450 ºC, allowing the material to be molded into precise, rigid shapes. Using this process, GM developed a production-ready magnesium rear deck lid inner panel that withstood 77,000 robotic slams and 250-kilogram (kg) impact drops without any issues. The rear deck lid inner panel would reduce weight by 1 kg compared to a steel deck lid inner panel (Bomey, 2012).

Scientists at the U.S. Department of Energy's (DOE) Ames Laboratory were working to improve a process developed in the 1990s using magnesium to separate the rare earth metals from the mix of other materials in neodymium-iron-boron magnet scrap. The goal of the original process was to produce a mixture of magnesium and neodymium because the neodymium added important strength to the alloy, rather than separate out high-purity rare earths because, at the time, rare earth prices were low. With the rapid increase in prices for rare-earth materials, the scientists' goal was to separate the rare earths so they could be recycled and used in new magnets. After breaking up sintered, uncoated magnets that contain neodymium, praseodymium, and dysprosium, chunks of magnesium are added, and the mixture is heated in a radio frequency furnace. As the magnesium melts, the three rare earths diffuse from the magnet pieces, which remain solid, and into the molten magnesium. The molten magnesium-rare-earths mixture is cast into ingots, then the magnesium is boiled off, leaving just the rare earths. The scientists planned to improve the process so it is commercially feasible (U.S. Department of Energy, 2012).

The U.S. Department of Justice and Pennsylvania's Department of Environmental Protection (DEP) filed suit in U.S. District Court to collect more than $1.13 million in cleanup costs from 16 companies that sent material to be recycled at Remacor Inc.'s defunct magnesium recycling plant in West

Pittsburg, PA. The plant operated from 1975 to 2005 when a fire destroyed some of its equipment. The suit alleged that Remacor continued accepting magnesium from companies even though it could not process the material and that the company mislabeled and mishandled the material. Beginning in 2006, DEP and the U.S. Environmental Protection Agency removed more than 2,700 t of waste from the site at a cost of $10.4 million (Frizell, 2012; Poole, 2012).

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TABLE 1
U.S. IMPORTS FOR CONSUMPTION AND EXPORTS OF MAGNESIUM[1]

(Metric tons)

		2012				
	2011	January–June	July	August	September	January–September
Imports for consumption:						
Metal	14,300	8,210	1,140	968	1,250	11,600
Waste and scrap	22,000	11,500	2,100	1,700	1,360	16,700
Alloys (magnesium content)	11,200	6,510	1,060	1,130	953	9,650
Sheet, tubing, ribbons, wire, powder, and other (magnesium content)	973	509	76	95	31	712
Total	48,400	26,800	4,370	3,900	3,590	38,600
Exports:						
Metal	5,520	3,860	309	649	495	5,310
Waste and scrap	1,680	1,600	216	189	16	2,020
Alloys (gross weight)	3,500	2,610	703	846	1,050	5,210
Sheet, tubing, ribbons, wire, powder, and other (gross weight)	1,620	991	136	157	135	1,420
Total	12,300	9,050	1,360	1,840	1,700	14,000

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 2
MAGNESIUM PRICES, THIRD QUARTER 2012

		Beginning of quarter	End of quarter
U.S. spot dealer import	dollars per pound	2.00–2.02	1.90–2.00
U.S. spot Western	do.	2.15–2.30	2.15–2.25
China	dollars per metric ton	3,100–3,140	3,230–3,280
European free market	do.	3,150–3,250	3,250–3,350

do. Ditto.

Source: Platts Metals Week.